



Leclanche
Zinc and
Carbon
Battery
(circa 1860s)

MOLECULAR EXPRESSIONS™ Electricity & Magnetism Introduction

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Section 01F 0101

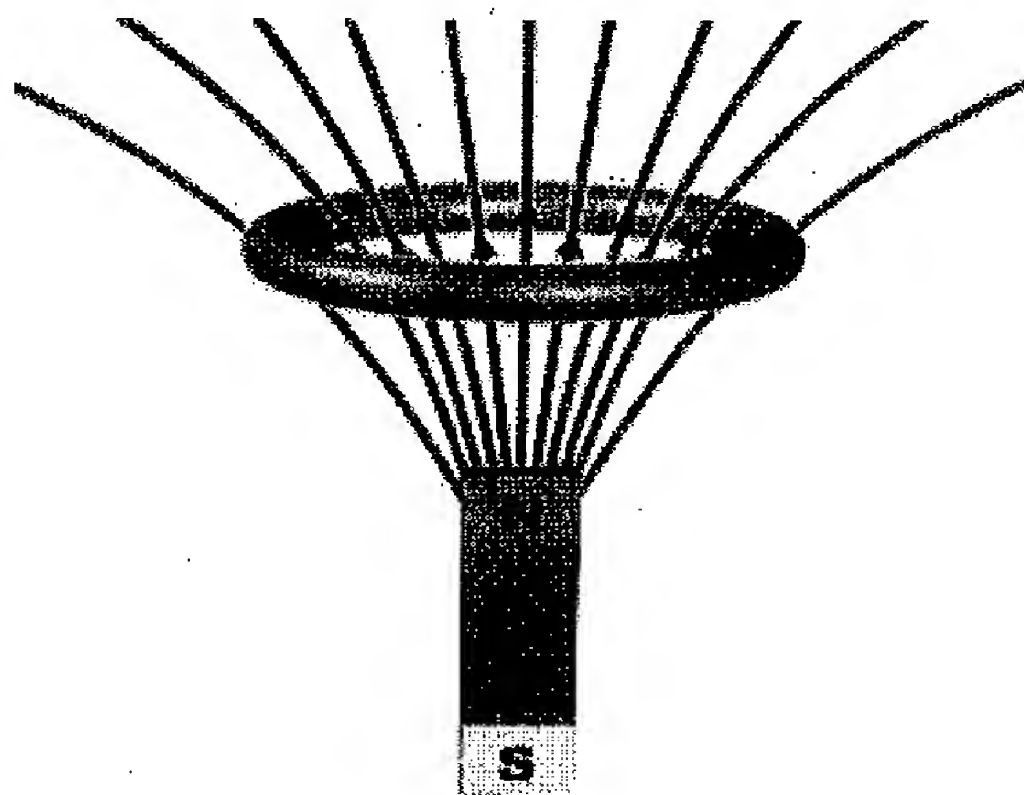
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Lenz's Law

In 1834, Russian physicist Heinrich Lenz discovered the directional relationships between induced magnetic fields, voltage, and current when a conductor is passed within the lines of force of a magnetic field. Lenz's law states:

"An induced electromotive force generates a current that induces a counter magnetic field that opposes the magnetic field generating the current."

This interactive Java tutorial explores how the movement of a bar magnet influences induced current in a stationary conductor. Operating instructions appear below the tutorial window.



To operate the tutorial, use the mouse to click and drag the magnet toward and away from the conducting ring.

When the field lines of the magnet (illustrated above in red) approach the conductor ring, a resulting electromagnetic force and current is generated within the ring. The movement of the yellow dots indicates the flow of conventional current, conceptualized as (non-existent) positive charge carriers, moving in an opposite sense to the electron flow. The current induces a secondary magnetic field (blue lines of force) inside the ring. Note that the direction of the induced magnetic field within the ring is oriented so that it opposes the change in magnetic field resulting from movement of the bar magnet.

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